Claims

1. A process for the production of L-ascorbic acid with an enzyme having the amino acid sequence of SEQ ID NO: 2 or an amino acid sequence that is 90% identical thereto, with the activity to produce L-ascorbic acid, whereby L-ascorbic acid is produced from a substrate which is selected from the group consisting of L-gulose, L-galactose, L-idose, and L-talose.

2. A process for the production of L-ascorbic acid with an enzyme having the amino acid sequence of SEQ ID NO: 2 or an amino acid sequence that is 90% identical thereto, with the activity to produce L-ascorbic acid, whereby L-ascorbic acid is produced from a substrate which is selected from the group consisting of L-gulono-1,4-lactone, L-gulonic acid, L-galactono-1,4-lactone, L-galactonic acid, L-idono-1,4-lactone, L-idonic acid, L-talono-1,4-lactone, and L-talonic acid.

3. A process for the production of L-gulono-1,4-lactone or L-gulonic acid with an enzyme having the amino acid sequence of SEQ ID NO: 2 or an amino acid sequence that is 90% identical thereto, with the activity to produce L-gulono-1,4-lactone or L-gulonic acid, whereby L-gulono-1,4-lactone or L-gulonic acid is produced from L-gulose.

4. A process for the production of L-galactono-1,4-lactone or L-galactonic acid with an enzyme having the amino acid sequence of SEQ ID NO: 2 or an amino acid sequence that is 90% identical thereto, with the activity to produce L-galactono-1,4-lactone or L-galactonic acid, whereby L-galactono-1,4-lactone or L-galactonic acid is produced from L-galactose.

5. A process according to any one of claims 1 to 4 comprising (a) contacting the enzyme with the respective substrate and (b) isolating the product which is selected from the group consisting of L-ascorbic acid, L-gulono-1,4-lactone, L-gulonic acid, L-galactono-1,4-lactone, and L-galactonic acid from the reaction mixture.

6. A process according to any one of claims 1 to 5, wherein the process is conducted for 1 to 120 h at a pH of about 1 to about 9 and at a temperature of about 13°C to about 45°C.

7. A process according to claim 6, wherein the process is conducted at a pH of about 2 to about 8 and at a temperature of about 18°C to about 42°C.

8. Use of Enzyme B of *G. oxydans* DSM 4025 in a process for producing L-ascorbic acid from a substrate which is selected from the group consisting of L-gulose, L-galactose, L-idose, L-talose, L-gulono-1,4-lactone, L-gulonic acid, L-galactono-1,4-lactone, and L-

galactonic acid; wherein Enzyme B has the following physico-chemical properties:

(a) molecular weight of about 60,000 Da on SDS-PAGE;

(b) substrate specificity for primary and secondary alcohols and aldehydes;

(c) pH-stability at pH of about 6 to about 9;

(d) pH-optimum at pH of about 8.0; and

(e) inhibited by Cu^{2+}, Zn^{2+}, Mn^{2+}, Fe^{2+}, and Fe^{3+}.

9. Use of Enzyme B of *G. oxydans* DSM 4025 in a process for producing L-gulono-1,4-lactone or L-gulonic acid from L-gulose, wherein Enzyme B has the following physico-chemical properties:

(a) molecular weight of about 60,000 Da on SDS-PAGE;

(b) substrate specificity for primary and secondary alcohols and aldehydes;

(c) pH-stability at pH of about 6 to about 9;

(d) pH-optimum at pH of about 8.0; and

(e) inhibited by Cu^{2+}, Zn^{2+}, Mn^{2+}, Fe^{2+}, and Fe^{3+}.

10. Use of Enzyme B of *G. oxydans* DSM 4025 in a process for producing L-galactono-1,4-lactone or galactonic acid from L-galactose, wherein Enzyme B has the following physico-chemical properties:

(a) molecular weight of about 60,000 Da on SDS-PAGE;

(b) substrate specificity for primary and secondary alcohols and aldehydes;

(c) pH-stability at pH of about 6 to about 9;

(d) pH-optimum at pH of about 8.0; and

(e) inhibited by Cu^{2+}, Zn^{2+}, Mn^{2+}, Fe^{2+}, and Fe^{3+}.

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